

## EXECUTIVE SUMMARY

The California Department of Transportation (Department) in consultation with the Office of Planning and Research (OPR) has conducted a statewide rail transportation assessment as required by Chapter 597, Statutes of 2001 (AB 1706 - Committee on Transportation) and Chapter 127, Statutes of 2000 (AB 2866 - Migden) (See Appendix A).

In his signing message on AB 2866, Governor Davis stated that the assessment should not address recommendations for projects directly supporting private freight rail capital needs. He directed that any rail capital recommendations made as part of the assessment be limited to those that are the proper subject of State funding (i.e. recommendations that benefit passenger rail services or publicly-owned freight rail facilities). The statewide rail transportation assessment fully addresses the two assembly bills consistent with the Governor's direction.

Key findings are included for:

- rail connectivity.
- track congestion.
- capital improvement plans.
- the cost effectiveness of rail investments.

As directed by statute, recommendations are made in the following two areas:

- Improving rail connectivity:
  - ◆ filling identified gaps in physical connectivity
  - ◆ performing schedule coordination improvements
  - ◆ capitalizing on recent technology advances to improve fare coordination
  - ◆ increasing connectivity information dissemination
- Providing congestion relief: identifying projects for new track, speed improvements and capacity improvements.

In today's environment of a fully connected but congested highway system, multi-modal solutions are necessary to address increasing levels of traffic congestion, particularly in the metropolitan areas of the State. At the same time, passenger rail connectivity needs improvement in order to optimize the effectiveness of the rail transportation mode. The analysis has shown that rail investments are similar in cost effectiveness to highway investments, indicating their important contribution of public benefits.

Key findings and recommendations by major focus area are summarized below. Technical appendices supporting these findings are available from the Department upon request.

## **Rail Connectivity**

### **Physical Connectivity**

Over the next ten years, infrastructure improvements will greatly improve physical rail connectivity in the Sacramento region and the San Francisco Bay Area (Bay Area). The biggest change is expected in the South San Francisco Bay Area. The San Francisco Bay Area Rapid Transit District (BART) extension to San Jose; the Santa Clara Valley Transportation Authority (VTA) extension to Milpitas currently under construction where VTA will connect with BART when the BART extension is completed; and the VTA extension to the San Jose Diridon Station, which is served by Caltrain, Amtrak, and Altamont Commuter Express (ACE), will greatly multiply direct rail connection options in those regions.

Neither Southern California nor the San Joaquin Valley will see markedly improved physical rail connectivity over the same period.

Twelve major direct connectivity gaps between rail systems have been identified in the State and are listed in the table on the following page. Filling these gaps would provide passengers with opportunities to transfer directly between rail systems without having to make multiple intermediate transfers. Various studies have shown that riders are generally reluctant to make multiple transfers in order to reach their destinations and will instead decide to use other modes. Such transfer requirements make rail a less practical travel option and contribute to highway congestion.

Two of these are scheduled to be addressed between now and 2012:

- The Sacramento Regional Transit (RT) light rail connection to the downtown Sacramento Amtrak station.
- The BART extension from Fremont to VTA light rail in Milpitas and to VTA, Caltrain, Amtrak and ACE in San Jose. The extension of VTA to Milpitas is currently under construction and the extension of VTA to the station in San Jose is in the planning stages.

In addition, the BART extension currently under construction from San Francisco/Colma to San Francisco International Airport and Caltrain service in Millbrae will fill another identified rail gap.

Today, only one airport is within walking distance of a train station, the Burbank Airport Station, which serves the Amtrak Surfliner and Metrolink routes. By 2012, between four and seven airports will have connections to rail systems.

Subject to the availability of funding and the identification of sufficient ridership demand, the State, in cooperation with the federal, local, and regional governments, and rail operators, should work to address the physical connectivity gaps identified. Implementation priorities will be established by local entities for commuter and urban rail systems through their Regional Transportation Plans (RTPs) and Regional Transportation Improvement Programs (RTIPs), as approved by the California Transportation Commission (CTC). For intercity rail, the Department establishes priorities through the Interregional Transportation Improvement Program (ITIP), again as approved by the CTC.

| Region                        | Between   | And  | Distance         |
|-------------------------------|---|--|------------------|
| <b>Sacramento Area</b>        | <b>Sacramento</b><br>Amtrak Station<br>serving<br>Capitol Corridor<br>San Joaquin<br>Coast Starlight<br>California Zephyr | <b>Sacramento</b><br>(St. Rose of Lima<br>Park station)<br>RT Light Rail   | <b>0.4 miles</b> |
| <b>San Francisco Bay Area</b> | <b>Emeryville</b><br>Amtrak Station<br>serving<br>Capitol Corridor<br>San Joaquin<br>Coast Starlight<br>California Zephyr | <b>San Francisco</b><br>Embarcadero Station<br>serving BART and<br>Muni  | <b>8.4 miles</b> |
|                               | <b>San Francisco</b><br>Caltrain Station  | <b>San Francisco</b><br>Powell Street Station<br>serving BART and<br>Muni  | <b>1 mile</b>    |
|                               | <b>Pleasanton</b><br>Altamont Commuter<br>Express (ACE) station   | <b>Dublin/<br/>Pleasanton</b><br>BART station  | <b>4 miles</b>   |
|                               | <b>Fremont</b><br>Amtrak/ACE Station<br>serving<br>Capitol Corridor   | <b>Palo Alto</b><br>Caltrain station<br>(via Dumbarton<br>Bridge)  | <b>17 miles</b>  |
|                               | <b>Fremont</b><br>BART station  | <b>Palo Alto</b><br>Caltrain station<br>(via Dumbarton<br>Bridge)  | <b>18 miles</b>  |
|                               | <b>Fremont</b><br>BART station  | <b>Milpitas</b><br>VTA light rail  | <b>12 miles</b>  |
|                               | <b>Fremont</b><br>BART station  | <b>San Jose</b><br>Caltrain station  | <b>19 miles</b>  |
|                               | <b>Fremont</b><br>BART station  | <b>San Jose</b><br>VTA station   | <b>16 miles</b>  |
|                               | <b>Antioch/Pittsburg</b><br>Amtrak Station  | <b>Pittsburg/<br/>Bay Point</b><br>BART Station  | <b>9 miles</b>   |
| <b>Southern California</b>    | <b>Bakersfield</b><br>Amtrak station<br>serving the<br>San Joaquins   | <b>Los Angeles</b><br>Union Station<br>serving Amtrak's<br>Pacific Surfliners,<br>Coast Starlight,<br>Southwest Chief,<br>Sunset Limited;<br>Metrolink;<br>Metro Rail Red Line | <b>110 miles</b> |
|                               | <b>Norwalk</b><br>MTA Green Line<br>station   | <b>Santa Fe Springs</b><br>Metrolink station   | <b>2.6 miles</b> |

## Schedule Coordination

Residents of dense urban areas are generally the best served in terms of schedule coordination. This is because high demand allows rail transit services to run more frequently, thus making them easier to coordinate. When at least one leg of a one-transfer rail trip is by an urban rail service (light rail, such as the San Diego Trolley, or heavy rail, such as BART), wait times are generally not very long due to the high frequency of urban rail trains.

Some of the most difficult connections in terms of schedule coordination involve transferring between commuter rail services or between a commuter rail service and an Amtrak California (intrastate) train (Pacific Surfliner, Capitol Corridor or San Joaquin). The reason for this is that these services do not run frequently enough to ensure that transfer times be reasonably brief. Without purposeful schedule coordination, many of these connections will by chance involve long wait times. For many key connections, at certain times of day wait times can be longer than an hour and for some they can be longer than two hours.

The only commuter rail station served by Amtrak California San Joaquin trains is the Stockton ACE station. This station could potentially provide a connection between the South Bay Area, which is served by ACE but not the San Joaquin, and the San Joaquin Valley cities south of Stockton (e.g. Fresno, Bakersfield), which are served by the San Joaquin train but not ACE. The two services, however, miss connections with each other. ACE trains are scheduled for commuters, leaving Stockton before 6 AM and arriving in Stockton after 6 PM, while San Joaquin trains are scheduled for longer distance leisure and business travel and serve Stockton at various times throughout the day.

Other difficult connections in terms of schedule coordination involve taking an Amtrak long distance (interstate) train for at least one leg of the trip and an Amtrak long distance, Amtrak California (State-supported intrastate services consisting of the Pacific Surfliner, San Joaquin, and Capitol Corridor) or commuter rail train for the other leg of the trip. The reason for this is that the Amtrak long distance services provide, at most, one train per day per direction and Amtrak California and commuter trains (with typical headways of one to two hours, especially off-peak) do not run frequently enough to make up for the infrequency of Amtrak long distance trains. Also, Amtrak's long distance trains are not as reliable in terms of schedule adherence as the Amtrak California and commuter trains, as they come long distances from their origination points – such as Chicago.

In the case of the Amtrak Coast Starlight service, most regional rail and other Amtrak long distance service connections in Los Angeles and the Bay Area are missed entirely. The Coast Rail Coordinating Council has proposed the addition of State-supported Coast Route service between San Francisco and Los Angeles. This service would help to provide key connections with commuter rail services (e.g. making rail trips possible between the Central Coast and San Bernardino or Riverside, and the Capitol Corridor to Sacramento).

Schedule coordination can be difficult, however, due to the need to schedule each train and type of service according to market demand from non-transferring passengers as well. Where the transfer involves an Amtrak long distance train, coordination is even

more difficult because these trains are not as reliable in terms of schedule adherence because of the longer distances they travel, as the Amtrak California and commuter trains. The respective rail agencies should work together to analyze demand for transfers and to schedule trains to facilitate such transfers, while maintaining overall passenger convenience.

It is recommended that rail operators work to improve the coordination of schedules, particularly to facilitate transfers between trains with less frequent service (Amtrak long distance, Amtrak California and commuter trains), as these transfers now tend to require the longest wait times. The Department will take a leading role to ensure the maximum possible schedule coordination between the State-supported intercity rail routes, and between such routes and long distance and commuter rail services.

### **Fare Coordination**

Currently, fare coordination between agencies is limited. However, this situation will improve shortly in the Bay Area and Los Angeles with the introduction of the TransLink and Universal Fare System regional fare programs in each region, respectively. Other similar region-wide fare integration efforts should be undertaken where feasible. Also, intercity (Amtrak) rail services could participate in these regional programs to increase statewide fare coordination and promote ridership. The Department, the Southern California Regional Rail Authority, and Amtrak are currently working together to integrate Pacific Surfliner and Metrolink fares in Southern California, and this effort could be expanded to other operators or incorporated into the Universal Fare System program. The Department will continue its efforts to integrate fares between its State-supported Amtrak services and commuter rail services throughout California.

### **Connectivity Information Dissemination**

The study found that the most comprehensive existing sources for transit connection information are the websites that provide general passenger information for all transit operators within a given geographic area. The most developed of these is transitinfo.org, which is supported by the Metropolitan Transportation Commission (MTC) in the Bay Area. The website contains maps, schedules, and links to individual rail operator websites. All regions should develop such comprehensive transit information websites. The Department will provide links from its statewide rail website to regional and rail operator websites and will continue to work with commuter rail operators to provide enhanced real-time information at stations where passengers can connect between Amtrak intercity and commuter rail services.

Given that not everyone has access to the internet, other sources of connection information need to be improved. Rail operators generally do not provide their telephone customer service agents with complete lists of connecting rail and transit services, limiting the ability of agents to assist the public. Some agencies list connecting rail and other transit services with phone numbers in printed pamphlets, but do not provide maps showing connection points. Others provide maps that depict transfer stations but do not provide any other information on connecting services, such as schedules.

Information provided within stations also varies widely. Some agencies have begun to address this problem by developing real-time passenger information displays within stations. Such systems typically display current information on the status and projected arrival time of the next train, but they could potentially be utilized to display information on train connections available at different stations as well. Real-time information systems have the potential to provide a particularly needed service at rural and unstaffed stations, where the lack of a station agent means that passengers have no other source of current information. Operators should work to make telephone information, printed materials, real-time passenger information, and other information sources more useful to connecting passengers.

## **Track Congestion**

Statewide, approximately \$4.7 billion worth of track congestion relief project needs over the next ten years have been identified by public passenger rail operators and public agencies that own freight rail facilities (e.g. ports); \$1.0 billion in projects are funded, and \$3.7 billion worth of projects are unfunded. Current track congestion levels and chokepoints, combined with the expected growth in rail services, require expanded rail systems and infrastructure improvements, (i.e. higher speeds, new track and more capacity improvements). The needs are inclusive of all track congestion projects the operators and the other sources identified above. For the purposes of this assessment, the study considered that the project totals identified reflect local needs and priorities. Actual costs may differ from the amounts stated in agency plans. The needs figures do not necessarily reflect any programming of funds or potential for return-on-investment.

A survey of the freight railroads conducted as part of this assessment identified the worst track congestion problems to be in the Los Angeles region between Los Angeles and San Bernardino/Riverside on both the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) due to heavy passenger and freight volumes. In addition, track congestion problems were identified between Gilroy and Fremont and between Stockton and Modesto.

The following are recommendations and findings regarding track congestion:

- At various locations throughout the State, the rail system is running out of capacity and existing freight demand is causing delays to passenger rail services. Expected growth in freight and passenger services will require expanded rail infrastructure in the future.
- \$3.7 billion to cover the cost of all currently identified but unfunded track congestion needs in California should be provided and spent over the next ten years.
- Subject to the availability of funding, it is recommended that the State, in cooperation with the federal, local, and regional governments, and rail operators, work to address the track congestion issues identified.

## **Capital Improvement Plans**

Capital plans identified for California, either noted in agency documents or reported by agencies and publicly owned freight rail facilities or their operators total \$16.2 billion. This amount includes both funded (\$9.8 billion) and unfunded (\$6.4 billion) needs. Slightly less than half of the unfunded needs, or \$2.8 billion, are identified for the short term [by Fiscal Year (FY) 2005]. The balance of \$3.6 billion makes up the

FY 2005-2011 need. Urban and light rail projects account for 52 percent of the total dollar value of all identified funded and unfunded needs, followed by intercity rail at 25 percent and commuter rail at 20 percent. Passenger service (e.g. new rolling stock, stations, and rail extensions) and capacity projects, such as double tracking and new sidings, account for nearly 94 percent of dollar value for all identified projects. As with track congestion projects, actual costs for capital improvement plans may differ from the amounts stated in agency plans.

State money represents only one-third of overall rail funding in California, with the State Transportation Improvement Program's Regional Improvement Program (STIP-RIP) and the Traffic Congestion Relief Program (TCRP) being the most important State sources. State funds are supplemented by a number of dedicated and discretionary federal and local sources.

Federal funds come primarily from the Federal Transit Administration for urban and commuter rail systems. Intercity rail (e.g. Amtrak Capitol Corridor, Pacific Surfliner, and San Joaquin) projects, however, are generally not eligible for federal capital funds. However, station projects sponsored by cities and counties, and track and signal projects sponsored by commuter rail agencies that benefit both commuter and intercity rail services are eligible for federal funding. Congress is currently considering legislation to provide a source of federal funding for intercity rail capital projects.

Local funding sources have grown with the passage of transportation sales tax measures in several counties. However, the relatively new requirement that dedicated transportation sales tax measures must receive a two-thirds majority vote for passage or renewal makes future approvals of such taxes more challenging.

### **Unfunded Operating Needs**

Short Range Transportation Plans and other documents were reviewed to determine unfunded operating needs for all rail operators statewide. Three agencies (BART, Muni, and Metrolink) identified a total shortfall of \$199 million for existing services. Agencies attempt to bridge shortfalls by increasing fares, containing costs, and/or finding new funding sources; otherwise they must reduce services to match available funds.

In addition to the identified deficits for existing services, various proposed new services also have unfunded operating needs. The amount of operating funding that would be required is, for most of these proposed new services, unknown at this time.

Although most agencies with existing rail services did not identify unfunded operating needs, this does not necessarily mean that operating funding levels, and therefore service levels, are optimal relative to passenger demand. If more operating funding were available, rail operators would likely provide more service.

### **Cost Effectiveness of Rail Investments**

This review offers several conclusions regarding the cost effectiveness of current funding for rail projects:

- As a whole, California rail investments are cost effective as measured by the California Life-Cycle Benefit/Cost Model (Cal-B/C). Rail projects are about equal in cost effectiveness to highway projects (with an average benefit-cost ratio of 2.3 versus 2.4, respectively – a benefit-cost ratio of 1.0 would be the break-even point between costs and benefits), but they also generate a number of public benefits that are difficult to quantify.
- Some enabling investments, such as the construction of new stations or the rehabilitation and maintenance of existing track and facilities, do not generate user benefits that the Cal-B/C model addresses. However, such improvements are essential to improve customer service and satisfaction and result in higher ridership and revenue.
- From a benefit-cost standpoint, the most cost effective investments appear to be those with relatively low capital costs and those that benefit multiple rail services.
- Track capacity projects provide the best benefit-to-cost ratio compared to passenger service and public safety projects. However, the track capacity projects included in the analysis are largely low-cost projects in rural areas, and not high-cost urban area projects requiring tunneling or new structures.
- California rail services recover a reasonable portion of their operating costs: 44 percent for commuter rail services, 47 percent for urban rail, and from 38 to 53 percent for intercity rail services.
- In recent years, ridership has grown faster than the increase in the level of service (in terms of rail vehicle miles). The level of service grew about 25 percent in the past five years, while ridership increased about 35 percent. If this trend continues, it should improve farebox recovery ratios in California, but it may also lead to overcrowding.